

**'THE PREVALENCE OF OBESITY AND ASSOCIATED  
MEDICAL CONDITIONS IN AN URBAN INDIAN  
GENERAL PRACTICE.'**

**by**

**C A D DAVID (M B Ch B)**

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D E D I C A T I O N

DEDICATED TO MY WIFE AND CHILDREN WHO  
HAVE BEEN A CONSTANT SOURCE OF INSPIRATION  
AND ENCOURAGEMENT

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## SUMMARY

The prevalence of obesity and associated medical conditions amongst Indian patients attending an urban Indian general practice in Phoenix was investigated.

Data were collected using standardized questionnaires and checklists. All obese patients, 18 years of age and older, who attended the Researcher's general practice were interviewed and examined, personally, by the Researcher. The study was conducted over a period of three months. In respect of identifying medical conditions associated with obesity, information from patients' records in the Researcher's general practice was utilized and where this was not available, a questionnaire to identify the aforementioned medical conditions, was administered to the patient. Data were collected, entered onto a collation sheet and analysed manually.

The prevalence rate of obesity for males and females was found to be 4% and 13% respectively. The majority (88%) of obese subjects were married and were housewives. A large number (81%) had received a low level of education. The majority (91%) did not smoke. Most (95%) did not consume any alcohol. The majority of obese subjects (70%) came from families consisting of between four and seven persons. Most were in the third and fourth decades of their lives (65%), and engaged in very little physical activity. The majority (70%) had a diet consisting mainly of carbohydrates, especially refined carbohydrates. Dyspnoea was the most commonly occurring medical condition in these subjects (32%). Next ranked osteoarthritis (23%); then varicose veins (10%); depression (10%); hypertension (9%); anxiety (6%); diabetes mellitus (4%); flat feet (2%); hernia (2%) and ischaemic heart disease (2%).

Obesity is associated with much morbidity. Efforts should be directed towards preventive measures as well as identifying and treating those obese persons who are at risk of developing obesity - associated diseases.



## INTRODUCTION

Obesity, after dental caries, is the commonest nutritional disorder in both developed and developing communities <sup>1</sup>.

Historically, according to Trowell <sup>1</sup>, obesity was uncommon until about three centuries ago, as evidenced by language, literature and art. This, of course does not imply that obesity was rare in the past. It must be remembered that with some exceptions, down through the ages, diet was accorded little role in the causation of disease. Indeed, scarcely a generation ago, in Africa, the deficiency disease, Kwashiokor was attributed variously to malaria, syphilis or other non-nutritional cause <sup>1</sup>.

Coming to near modern times, Osler, before the turn of the century, attributed obesity to excessive food intake, to insufficient exercise, and excessive alcohol consumption. Since then, in Western prosperous populations frequency of obesity has risen, particularly during the last 20 to 30 years. Moreover in developing populations, there is ample evidence that frequency of obesity, especially among females has increased markedly <sup>1</sup>. Whilst this disorder is more pronounced in those living in urban areas, rural dwellers also are becoming increasingly affected <sup>1</sup>.

Yet this common disorder is frequently overlooked because the doctor is preoccupied by one of its many complications or ignores it because it is so familiar <sup>2</sup>.

Its significance requires constant emphasis because it is associated with increased mortality, predisposes to the development of important diseases and diminishes the happiness of those affected <sup>2</sup>.

In South Africa, unfortunately with some exceptions, knowledge of frequency of obesity in our populations and sub-populations is very inadequate <sup>1</sup>.

The problem for investigation is that the prevalence of obesity and associated medical conditions amongst Indian patients attending an urban Indian general practice in Phoenix is not known.

Phoenix was established by the Durban City Council as a low cost housing scheme for Indians <sup>3</sup>. Many people were resettled here because of the Slum Clearance and Group Areas Acts <sup>4</sup>. At present there are about 122,000 <sup>5</sup> people living in Phoenix. Recreational or sporting facilities are either few or non-existent; for example, there is only one swimming pool for the entire Phoenix township. Squash courts, tennis courts or health gymnasiums are non-existent.



## DEFINITION OF OBJECTIVES

- 1) To determine the prevalence of obesity in the Researcher's general practice in Phoenix.
- 2) To identify medical conditions associated with obesity.
- 3) To determine the personal characteristics of the obese patient.
- 4) To make recommendations in respect of reducing the prevalence of obesity and associated medical conditions.

## DEFINITION OF CRITERIA

A) **Obesity:**

Any person whose weight is in excess of the range in the height/weight normogram is defined as obese. (Annexure C.)

B) **General Practice:**

Comprehensive practice of general medicine at preventive, promotive, diagnostic, therapeutic and rehabilitative levels and directed to individual patients and their families in terms of the needs of the particular service in which the practitioner operates and the communities he serves.

C) **Phoenix:**

An Indian township situated approximately twenty kilometres north of central Durban. It provides housing for Indians in the economic and sub-economic groups. (Annexure D.)

D) **Urban:**

Pertaining to characteristic of, including or constituting a city.

E) **Patient:**

All patients 18 years of age and older and who attend the Researcher's practice for the first time during the study period.

F) **Lifestyle:**

Personal characteristics of the patient ie age, sex, education, employment, occupation, marital status, family size, habits relating to alcohol and smoking.

G) **Eating Habits:**

Recall of the patient's diet the day prior to attending the Researcher's practice for health care.

H) **Physical Activities:**

Sports (soccer, cricket, tennis, squash, swimming, karate, judo, athletics) gardening, jogging, walking.

I) **Family Size:**

All members living under the same roof and who are interdependent financially and socially.

J) Associated Medical Conditions:

- depression
- anxiety

Mechanical Disabilities

- flat feet
- osteoarthritis of knee, hips and lumbar spine
- hernia
- varicose veins
- exertional dyspnoea

- gout
- diabetes mellitus

- hypertension
- ischaemic heart disease

## REDUCTION OF BIAS

### A) **Sample:**

All Indian patients 18 years of age and older who attended the Researcher's general practice during the study period and who were obese as defined in the criteria were included in the sample.

### **Control:**

No control group was used for the purpose of this study.

- B) Standard questionnaires and check lists for data collection were used.
- C) The entire study was conducted by the Researcher in his general practice.
- D) Adherence to the protocol.

## **METHOD OF DATA COLLECTION**

All patients selected for inclusion in the study were informed of the confidentiality of data collected. Data was collected using standardized questionnaires and checklists (Annexure E.)

The patients were interviewed personally by the Researcher. The study was conducted over a period of three months.

In respect of identifying medical conditions associated with obesity information from patients' records in the Researcher's general practice was utilized and where this was not available, a questionnaire to identify the above conditions was administered to the patient.

The study was conducted in the Researcher's general practice during the period 1/8/1985 to 31/10/1985. Data was collected manually, analysed and entered onto standardised tables (Annexure A.)

## R E S U L T S

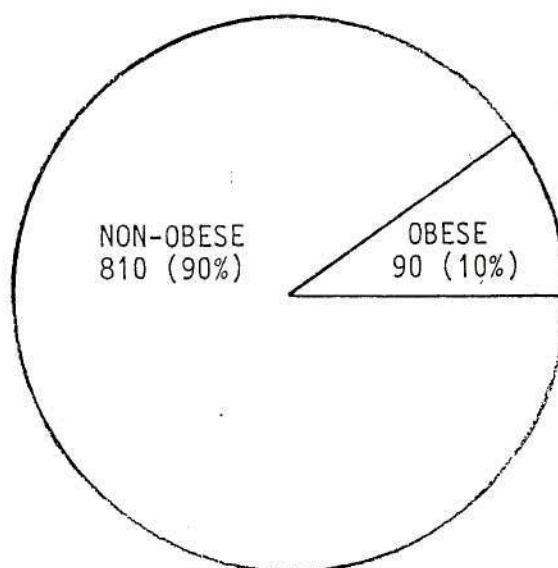
### Prevalence of Obesity According to the Sex of the Patient (Table 1)

**Prevalence:** (Figure 1). Of the 900 patients seen during the study period, 90 (10%) were obese and 810 (90%) were not obese. (Table 1)

**Sex:** Of the 900 patients, 280 (31%) were males and 620 (69%) were females. Of the males, 10 (3,6%) were obese and 270 (96,4%) were not obese. The prevalence rate of obesity amongst males was 4%.

Of the females, 80 (12,9%) were obese and 540 (87,1%) were not obese. The prevalence rate of obesity amongst females was 13%.

FIGURE 1



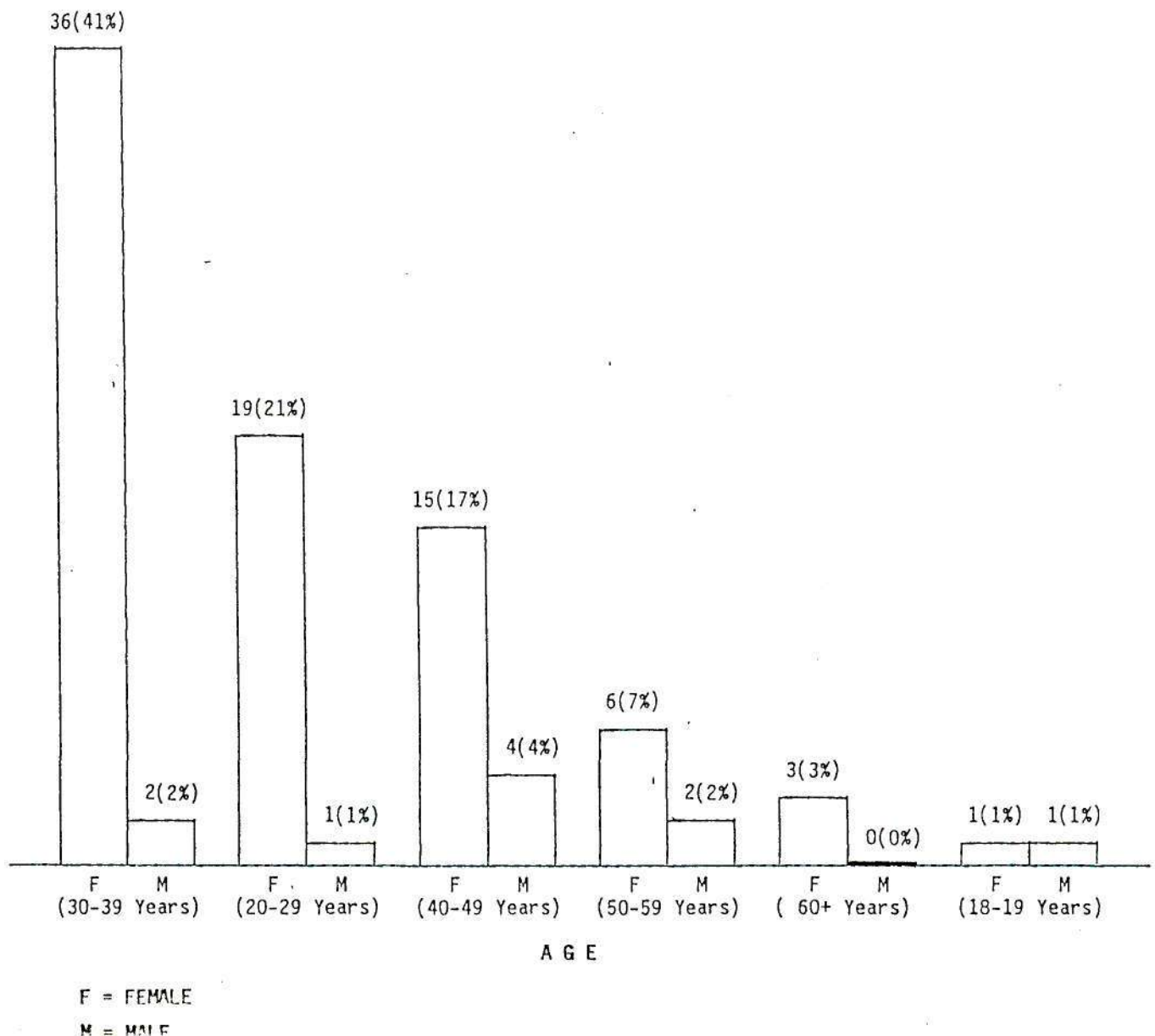
PREVALENCE OF OBESITY



AGE BY SEX DISTRIBUTION OF OBESE PATIENTS: (TABLE 2 AND FIGURE II)

The majority of obese patients ie 38 (43%) were in the age group 30 - 39 years, and of this 2 (2%) were males and 36 (41%) were females. 20 (22%) were in the age group 20 - 29 years, and of this 1 (1%) was male and 19 (21%) were females. 19 (21%) were in the age group 40 - 49 years and of this, 4 (4%) were males, and 15 (17%) were females. 8 (9%) were in the age group 50 - 59 years and of this, 2 (2%) were males and 6 (7%) were females. 3 (3%) were in the age group 60+ years and all were females. 2 (2%) were in the age group 18 - 19 years and of this, 1 (1%) was male and 1 (1%) female. In the case of males 4 (40%) were under 40 years and 6 (60%) were older while in the case of females 56 (70,1%) were under 40 years and 24 (29,9%) were older.

FIGURE II



**DISTRIBUTION OF ASSOCIATED MEDICAL CONDITIONS ACCORDING TO AGE:**

**(TABLE 3 AND FIGURE III)**

'Dyspnoea' was the commonest presenting symptom/medical condition, occurring 77 (32%) times. It occurred mainly in the age group 30 - 39 years.

'Osteoarthrosis', occurred in 56 (23%) patients mainly in the age group 30 - 39 years.

'Varicose veins', occurred in 24 (10%) patients. It occurred mainly in the age group 30 - 39 years.

'Depression', occurred in 23 (10%) patients mainly, in the age group 20 - 29 years.

'Hypertension', occurred in 22 patients (9%) mainly in the 40 - 49 age group.

'Anxiety', appeared in 15 (6%) patients mainly in the age group 30 - 39 years.

'Diabetes Mellitus', occurred in 9 (4%) patients and mainly in 30 - 39 year age group.

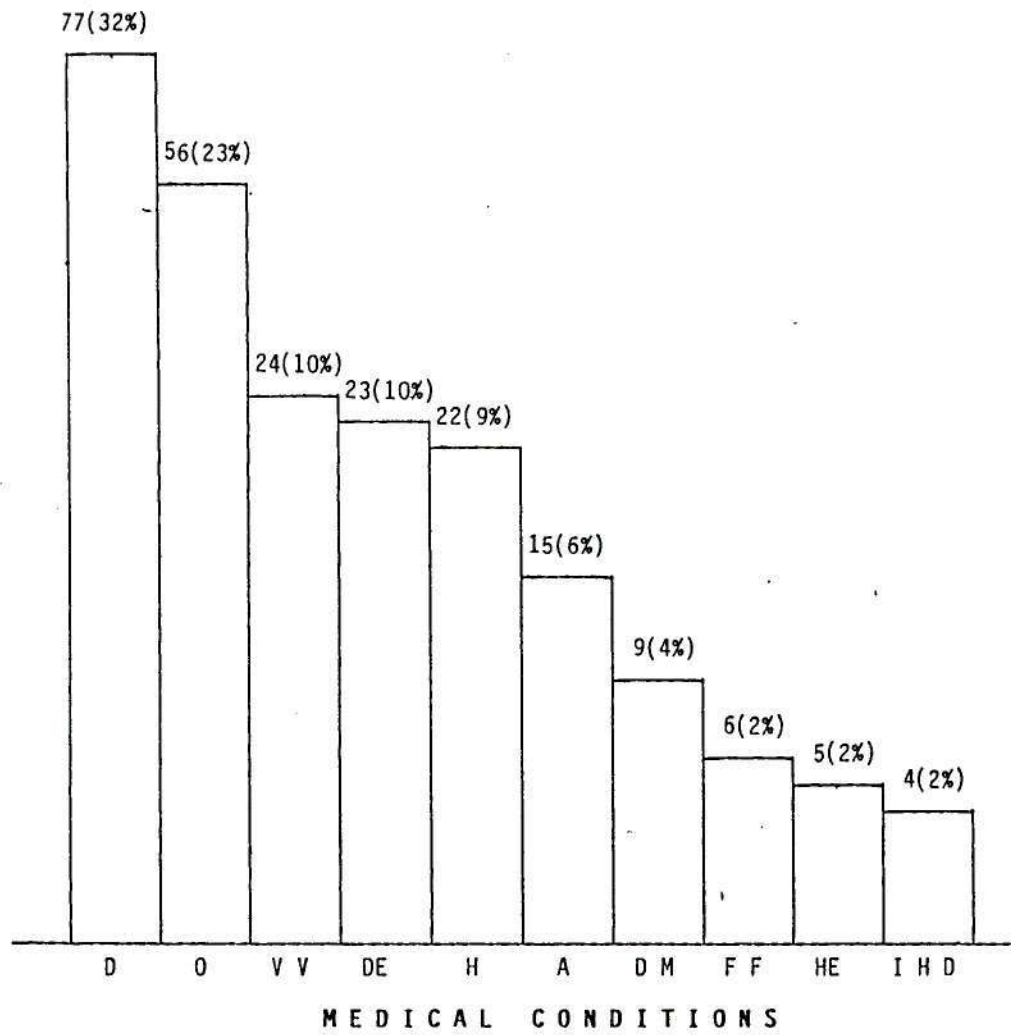
'Flat feet' occurred in 6 (2%) patients and mainly in the 30 - 39 year age group.

'Hernia', occurred in 5 (2%) patients and mainly in the 30 - 39 year age group.

'Ischaemic Heart Disease' occurred in 4 (2%) patients mainly in the 40 - 49 year age group.

There were no cases of gout.

FIGURE III



KEY:

- D - DYSPNOEA
- O - OSTEOARTHRISIS
- V V - VARICOSE VEINS
- DE - DEPRESSION
- H - HYPERTENSION
- A - ANXIETY
- D M - DIABETES MELLITUS
- F F - FLAT FEET
- HE - HERNIA
- I H D - ISCHAEMIC HEART DISEASE

**DISTRIBUTION OF ASSOCIATED MEDICAL CONDITIONS ACCORDING TO SEX:**

**(TABLE 4 AND FIGURE IV)**

'Dyspnoea' ranked first, occurring in 68 (85%) female subjects and 9 (90%) males.

'Osteoarthritis', occurred in 50 (62,5%) females and in 6 (60%) males.

'Varicose veins', occurred in 24 (30,0%) females. No male presented with varicose veins.

'Depression', occurred in 23 (28,8%) females. No male presented with depression.

'Hypertension' occurred in 16 (20,0%) females and in 6 (60%) males.

'Anxiety', occurred in 13 (16,3%) females and in 2 (20,0%) males.

'Diabetes Mellitus', occurred in 6 (7,5%) females and in 3 (30,0%) males.

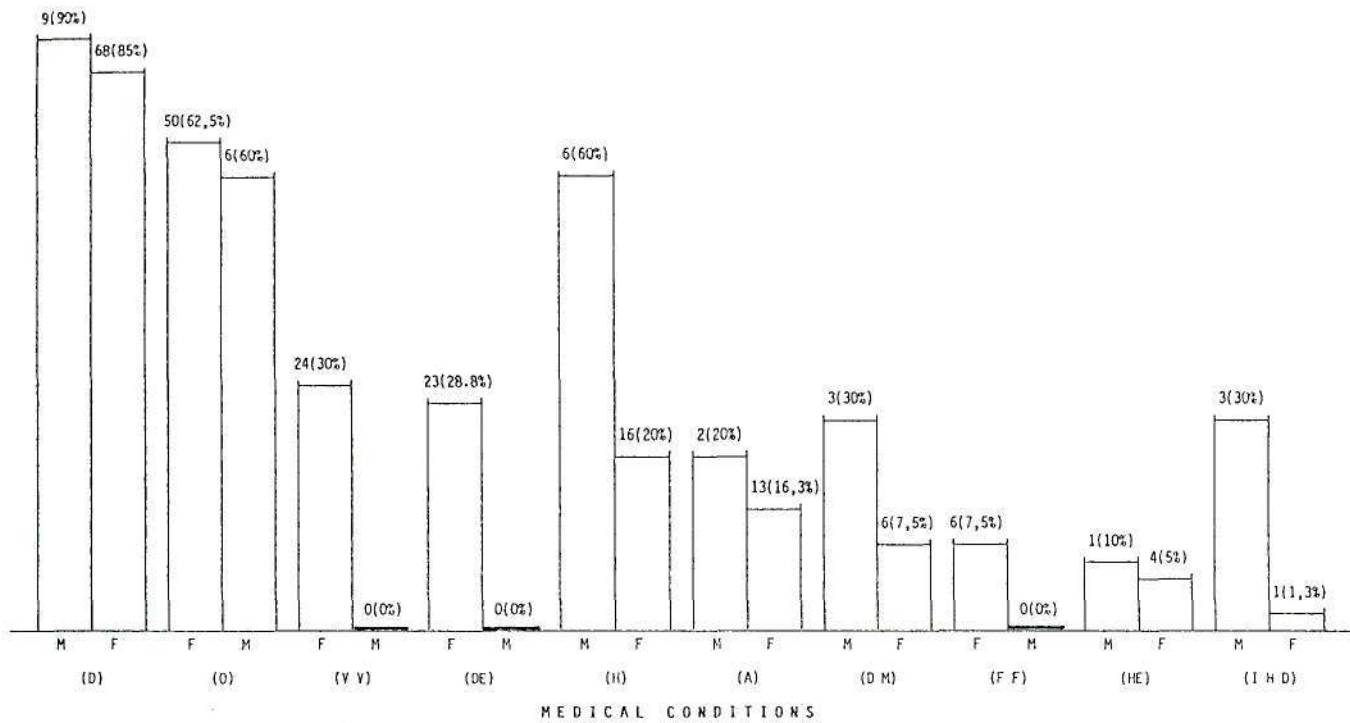
'Flat feet', occurred in 6 (7,5%) females only. No males had flat feet.

'Hernia', occurred in 4 (5,0%) females and in 1 (10%) males.

'Ischaemic Heart Disease', occurred in 1 (1,3%) females and in 3 (30,0%) males.

The small number of males precludes statistical analysis.

FIGURE IV



KEY (1)

F = FEMALE

M = MALE

KEY (2)

D = DYSPNOEA

O = OSTEOARTHRITIS

V V = VARICOSE VEINS

DE = DEPRESSION

H = HYPERTENSION

A = ANXIETY

D M = DIABETES MELLITUS

F F = FLAT FEET

HE = HERNIA

I H D = ISCHAEMIC HEART DISEASE

#### EDUCATION LEVELS ACCORDING TO AGE: (TABLE 5)

**Education Levels:** (Figure V). 19 (21%) of obese subjects received no education; 54 (60%) had received a 'Class 1 - Standard VI' education; 16 (18%) had had a 'Standard VII - Matric' level of education and 1 (1%) had a 'Post-Matric' level.

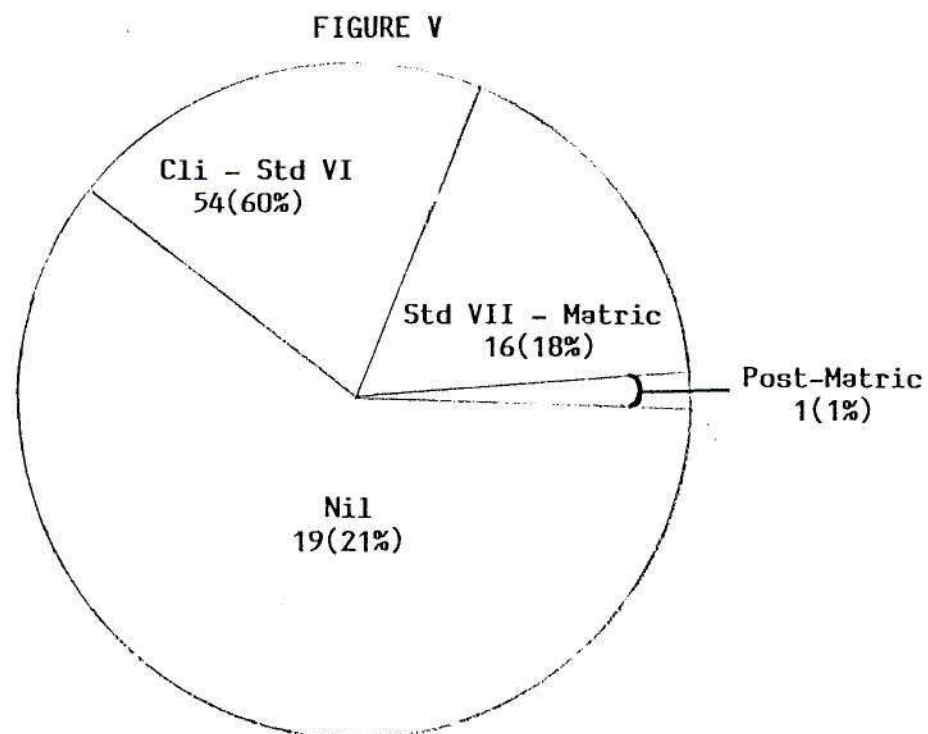
Owing to the small number of cases, only general comments are made concerning the educational level of obese patients.

**Age:** Of the 19 (21%) who had no education the majority were in the age group 30 - 39 years.

Of the 54 (60%) who had a primary level education, the majority was in the 30 - 39 years of age group.

Of the 16 (18%) who had a secondary level education, most were in the 20 - 29 years of age group.

Only 1 (1%) had a tertiary level of education and was in the 20 - 29 years age group.



DISTRIBUTION OF EDUCATION LEVELS

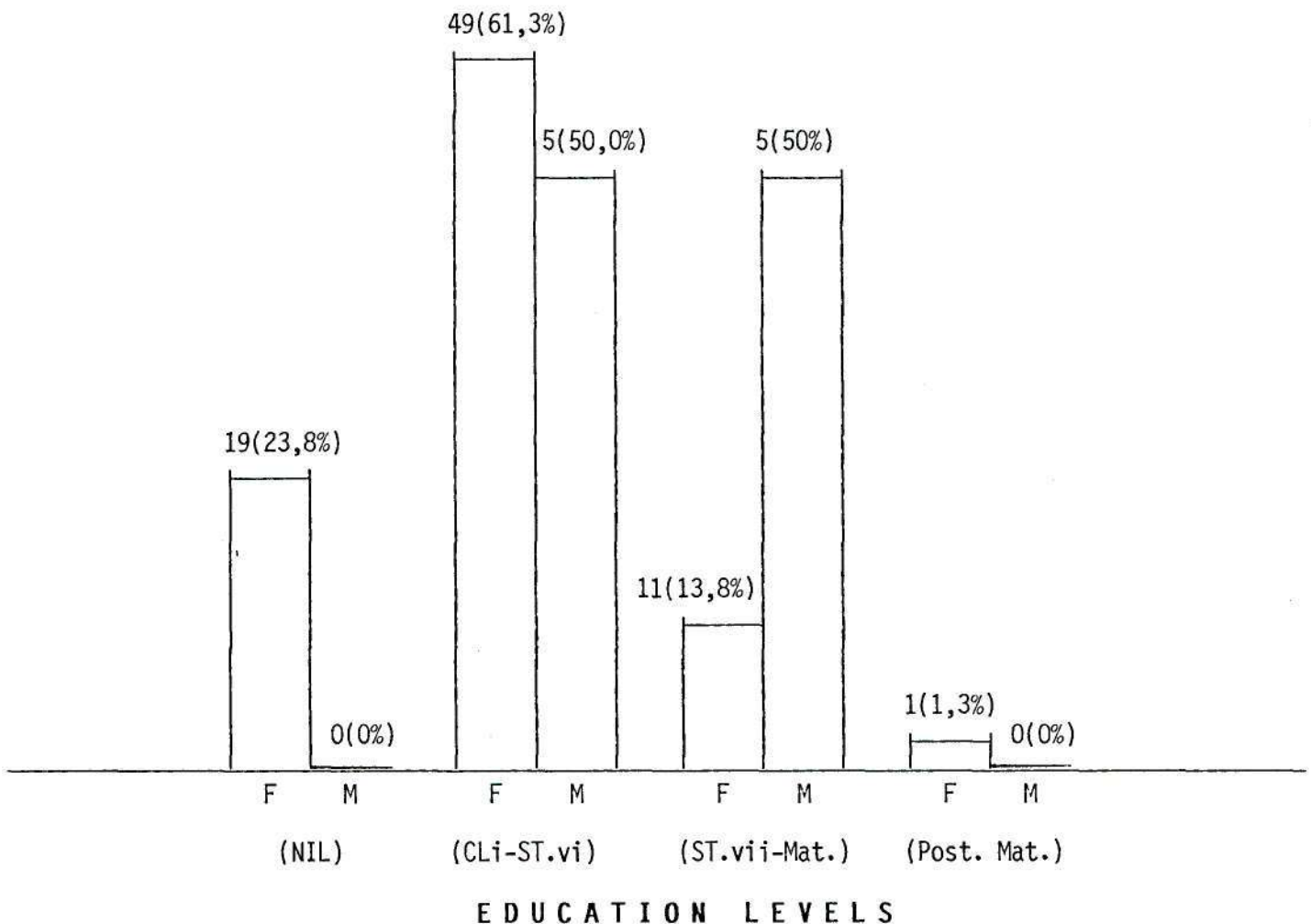


**EDUCATION LEVELS ACCORDING TO SEX: (TABLE 6 AND FIGURE VI)**

Of the 80 females 19 (23,8%) had received no education, 49 (61,3%) had received education not further than standard VI, 11 (13,8%) had experienced secondary education and 1 (1,3%) had post-matriculation education.

Of the 10 males, 5 (50,0%) had experienced primary school education and 5 (50,0%) had experienced secondary education.

**FIGURE VI**



**KEY:**

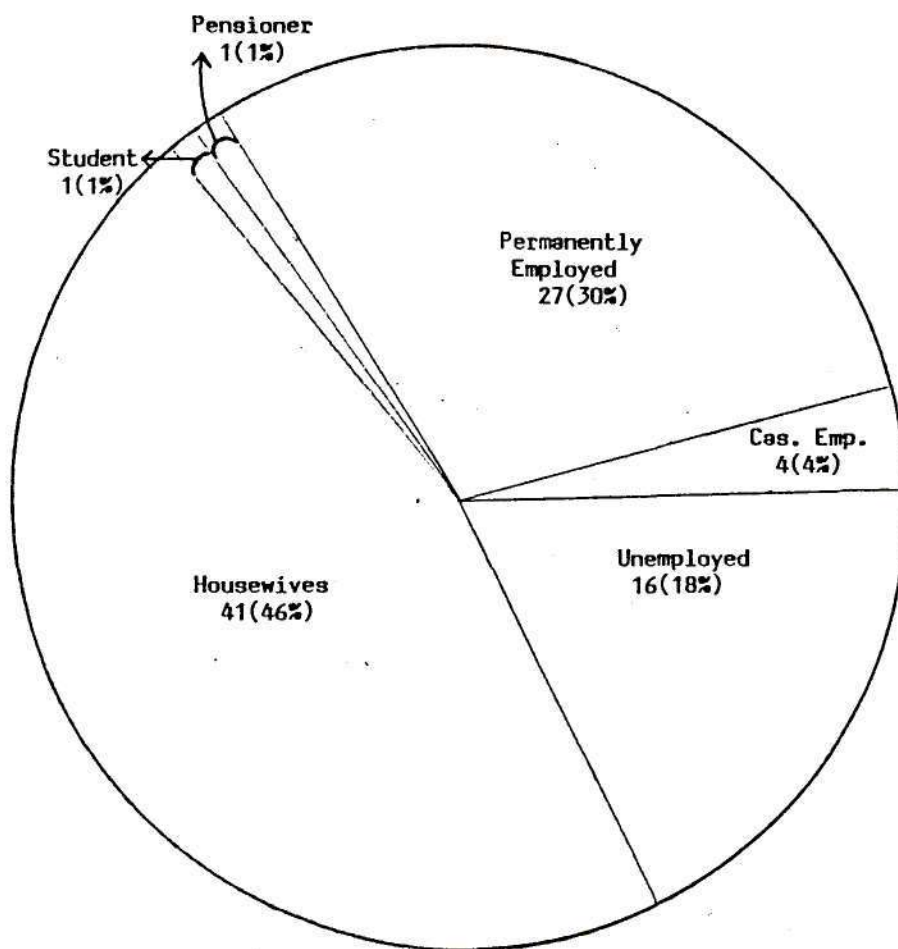
**F - FEMALE**

**M - MALE**

**EMPLOYMENT STATUS OF OBESE PATIENTS: (TABLE 7 AND FIGURE VII)**

Of the 90 obese subjects, 16 (18%) were unemployed; 41 (46%) were housewives; 1 (1%) a pensioner; 1 (1%) a student; 27 (30%) permanently employed and 4 (4%) casually employed.

**FIGURE VII**

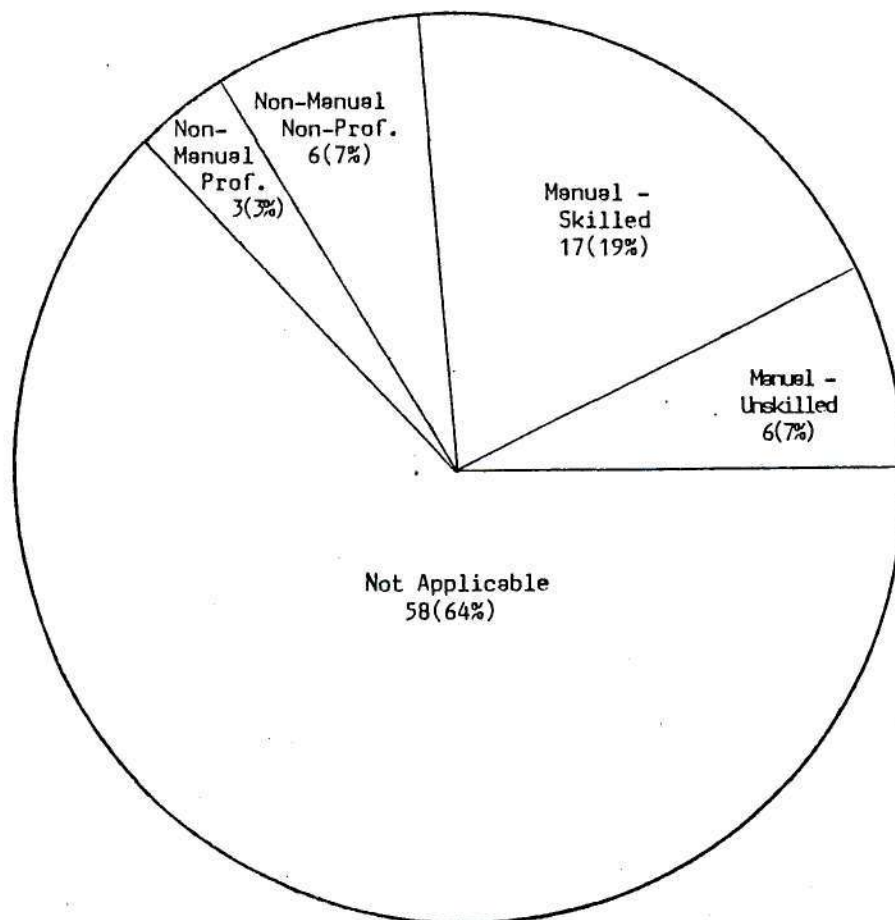


**EMPLOYMENT STATUS OF PATIENTS**

TYPE OF EMPLOYMENT HELD BY OBESE SUBJECTS: (TABLE 8 AND FIGURE VIII)

Of the 90 obese subjects, 58 (64%) held no job at all; 3 (3%) held non-manual professional jobs; 6 (7%) had non-manual non-professional jobs; 17 (19%) had manual skilled jobs and 6 (7%) had manual unskilled jobs.

FIGURE VIII

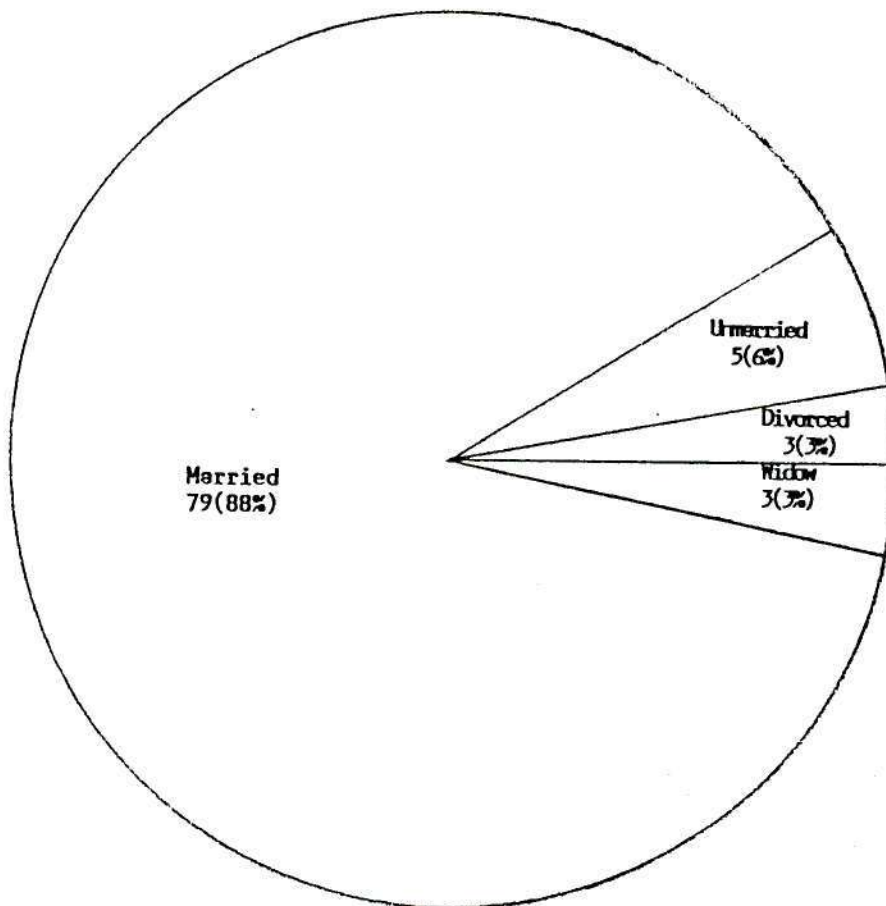


TYPE OF EMPLOYMENT

**MARITAL STATUS OF OBESE PATIENTS: (TABLE 9 AND FIGURE IX)**

Of the 90 obese subjects, 79 (88%) were married; 5 (6%) unmarried; 3 (3%) divorced and 3 (3%) widowed.

**FIGURE IX**

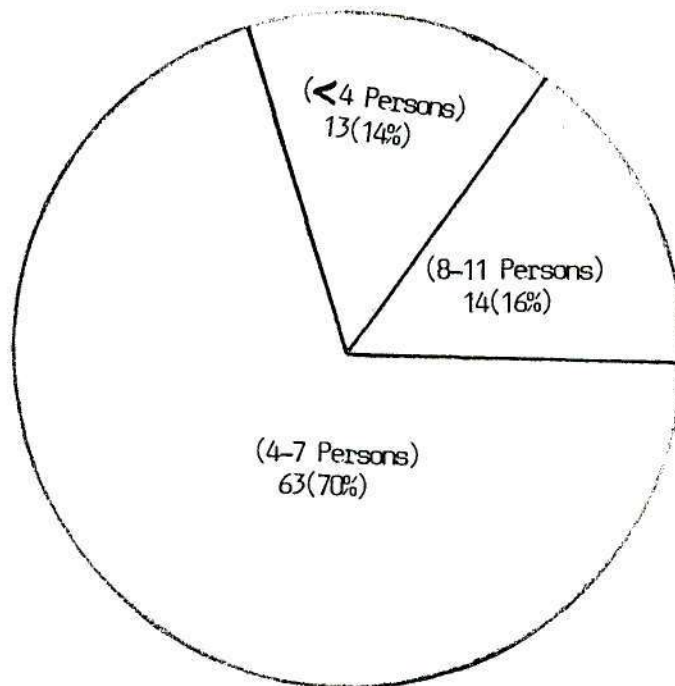


**MARITAL STATUS**

**FAMILY SIZE OF OBESE PATIENTS: (TABLE 10 AND FIGURE X)**

Of the 90 obese subjects, 13 (14%) had a family size of  $< 4$  persons; 63 (70%) had a family size of between 4 and 7 persons; 14 (16%) had a family size of 8 - 11 persons and none had a family size of 12+ persons.

**FIGURE X**



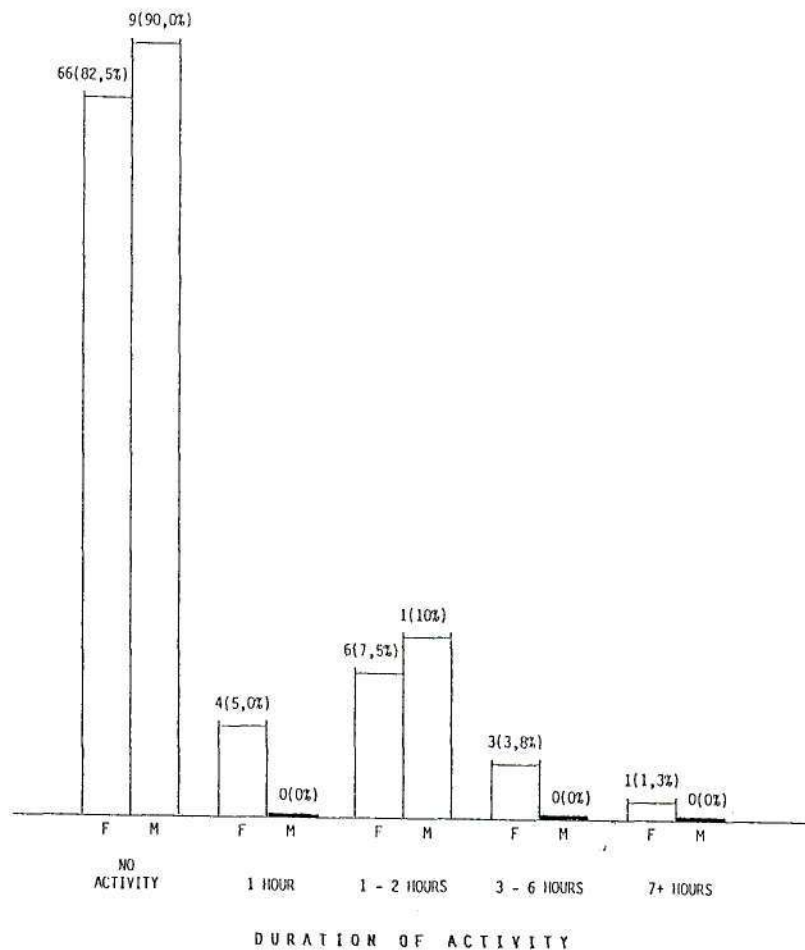
**FAMILY SIZE OF OBESE SUBJECTS**

**DURATION OF PHYSICAL ACTIVITIES PERFORMED ACCORDING TO SEX:  
(TABLE 11 AND FIGURE XI)**

Of the obese male subjects, 9 (90%) did not engage in any physical activities at all and 1 (10%) engaged in physical activities of between 1 - 2 hours duration.

Of the female subjects, 66 (82,5%) performed no physical activities at all; 4(5,0%) engaged in physical activities of less than 1 hours duration; 6 (7,5%) engaged in 1 - 2 hours of physical activities; 3 (3,8%) in 3 - 6 hours of activity and 1 (1,3%) in (7+) hours.

**FIGURE XI**



**KEY:**

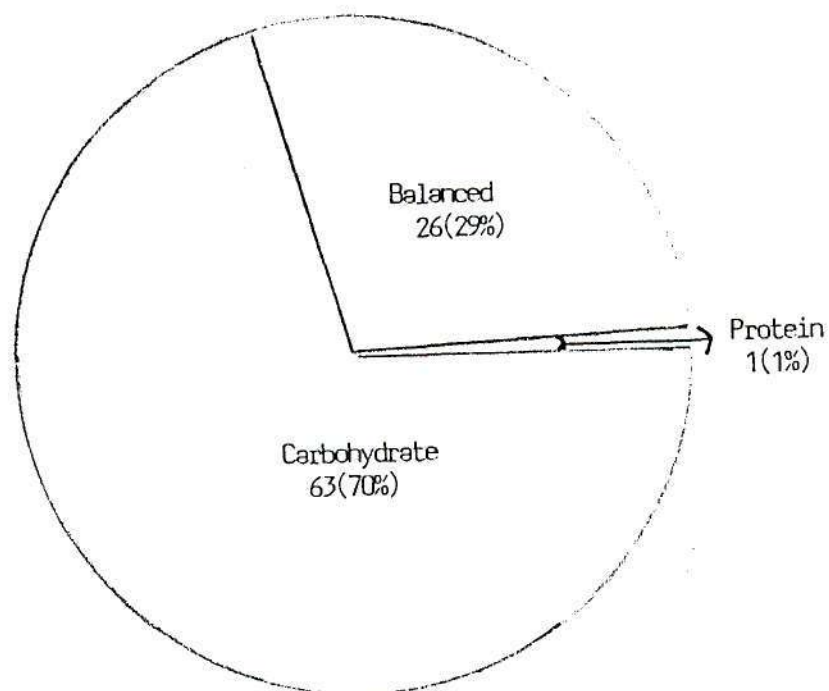
F - FEMALE  
M - MALE



MAIN DIETARY HABITS ACCORDING TO FAMILY SIZE: (TABLE 12)

Of the obese subjects, 63 (70%) had a diet excessive in carbohydrates, 1 (1,0%) had a diet excessive in protein, 26 (29%) had a diet consisting of a mixture of carbohydrates, protein, and fats (balanced). None had a diet excessive in fats.

FIGURE XII



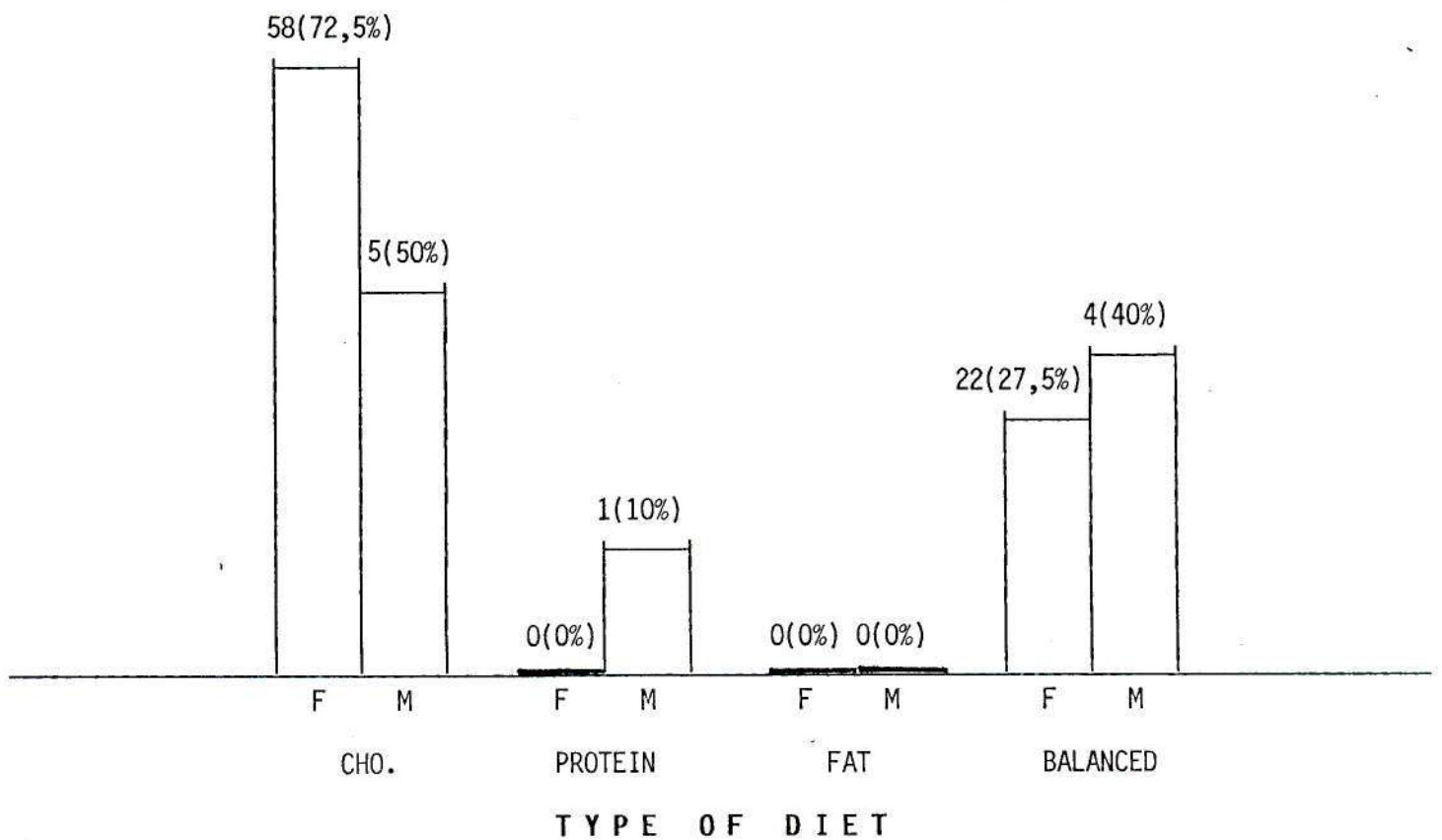
DIETARY HABITS OF OBESE SUBJECTS

**MAIN DIETARY HABITS ACCORDING TO SEX: (TABLE 13 AND FIGURE XIII)**

Of the obese male subjects, 5 (50%) had a mainly carbohydrate diet, 4 (40%) had a balanced diet and 1 (10%) had a mainly protein diet.

Of the female subjects, 58 (72,5%) had a mainly carbohydrate diet and 22 (27,5%) had a balanced diet.

**FIGURE XIII**



**KEY:**

**F - FEMALE**

**M - MALE**

**MAIN DIETARY HABITS ACCORDING TO EDUCATION LEVELS: (TABLE 14)**

Of the 63 (70%) subjects who had a diet excessive in carbohydrates, 13 (68,4%) had no education; 39 (72,2%) had a 'primary level' education; 10 (62,5%) had a 'secondary level' education; and 1 (100%) a tertiary level education.

(FIGURE XIV)

Only 1 (6,3% ) subject had a diet excessive in protein and this subject had a secondary level education. (FIGURE XV)

Of the 26 (29%) subjects who had a diet consisting of carbohydrates, fats and protein, 6 (31,6%) had no education; 15 (27,8%) had a primary level education; 5 (31,3%) had a secondary level education. (FIGURE XVI)

No subject had a diet excessive in fats.

**FIGURE XIV**

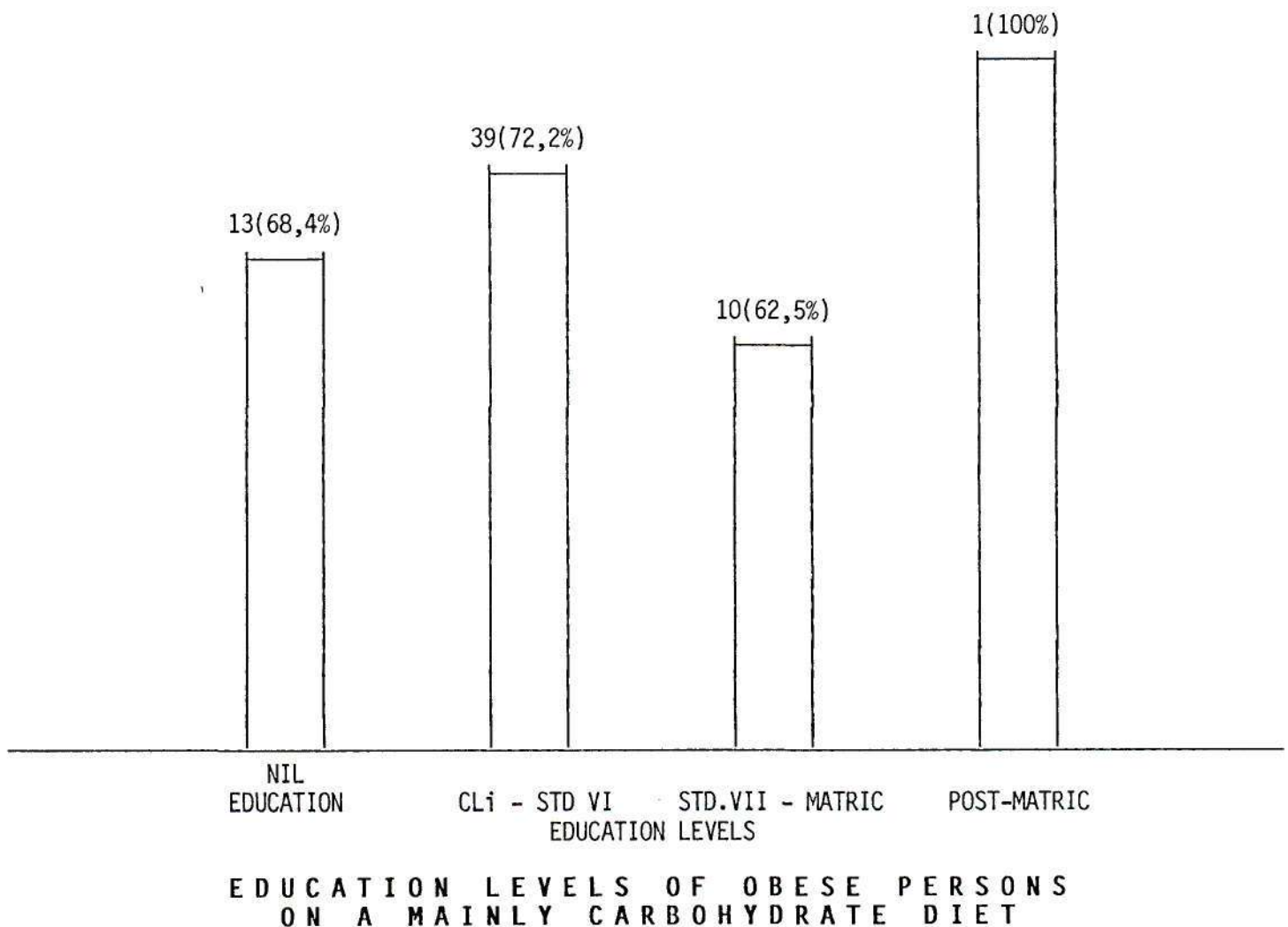
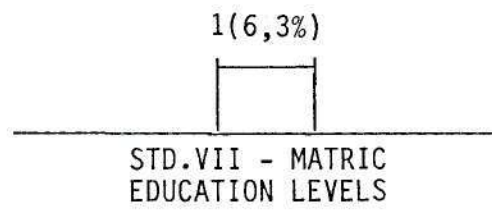
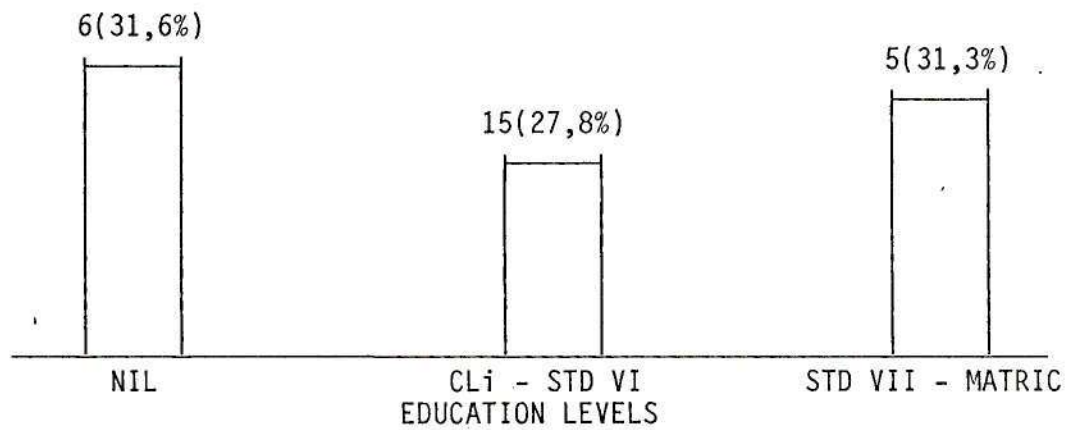


FIGURE XV



EDUCATION LEVELS OF OBESE PERSONS  
ON A MAINLY PROTEIN DIET

FIGURE XVI



EDUCATION LEVELS OF OBESE PERSONS  
ON A BALANCED DIET

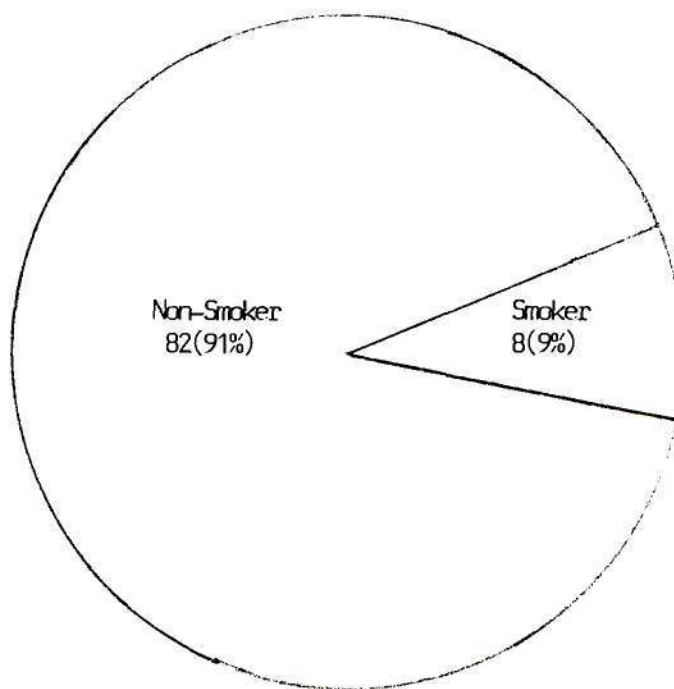
**SMOKING HABITS ACCORDING TO EMPLOYMENT STATUS: (TABLE 15)**

Of the 90 obese subjects, 8 (9%) were smokers and 82 (91%) were non-smokers. (FIGURE XVII)

Of those who smoked, 6 (7%) were permanently employed; 1 (1%) was a pensioner and 1 (1%) was employed casually.

Of those who did not smoke, 41 (46%) were housewives; 21 (23%) were permanently employed; 16 (18%) had no employment; 3 (3%) were employed casually and 1 (1%) was a student.

**FIGURE XVII**



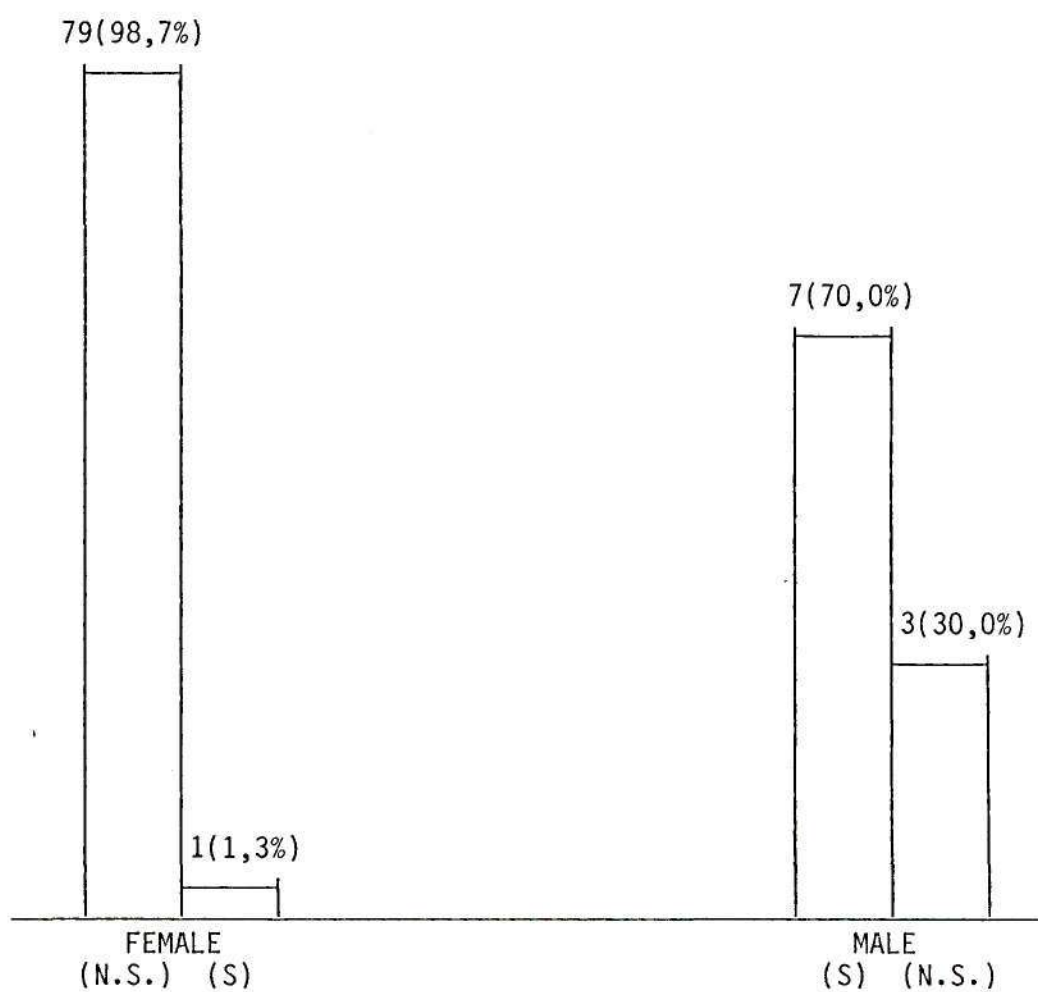
**PREVALENCE OF SMOKING IN OBESE PATIENTS**

SMOKING HABITS ACCORDING TO SEX: (TABLE 16 AND FIGURE XVIII)

Of the obese female subjects, 79 (98,7%) were non-smokers and one (1,3%) smoked.

Of the obese male subjects, 7 (70,0%) were smokers and 3 (30,0%) were non-smokers.

FIGURE XVIII



KEY:

N.S. - NON-SMOKER

S. - SMOKER



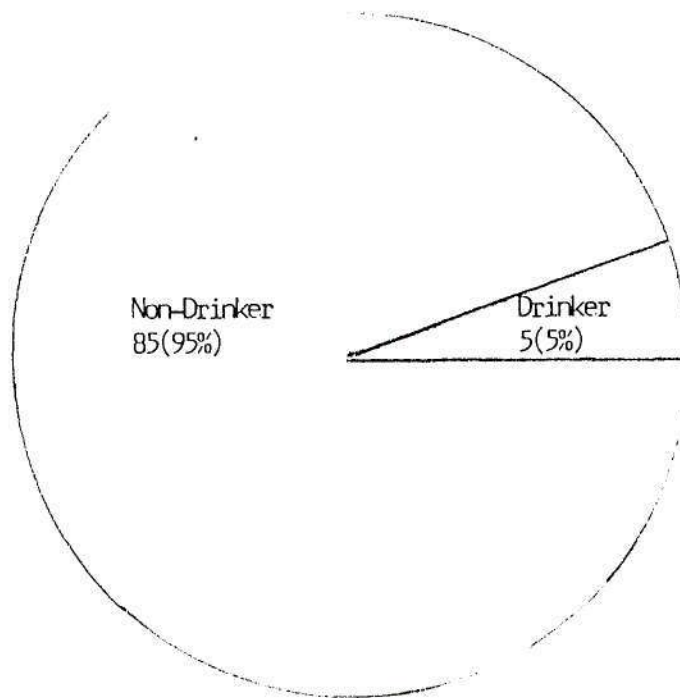
**ALCOHOL CONSUMPTION ACCORDING TO SEX: (TABLE 17)**

Of the 90 subjects, 85 (96%) were non-drinkers and 5 (5%) consumed alcohol. (FIGURE IX)

Of the non-drinkers, 5 (50,0%) were males and 80 (100%) were females.

Of the drinkers, all were males, 3 (30,0%) consuming < 1 bottle / week of spirits and 2 (20,0%) consumed 1 or more bottles of beer per week.

**FIGURE XIX**



**PREVALENCE OF ALCOHOL CONSUMPTION**

No tests of association were done due to the small number of cases, particularly in respect of males.

## D I S C U S S I O N

### **Limitations of Study:**

The number of subjects in this study was small. Due to the prevailing economic recession at the time of the study, unemployment was high and fewer people visited private medical practitioners for their health needs. Perhaps, the study period should have been extended to say, six months or a year. The small number of cases precluded statistical analysis of the results.

The questionnaire was inadequate in that no consideration was made of women taking oral contraceptives, especially so, when the greater proportion of subjects was made up of females.

Difficulties were experienced in eliciting information regarding diet and alcohol consumption. There appeared to be under-reporting especially with respect to alcohol consumption.

A control group is necessary for comparison purposes. In this study no control group was included; however, between sub-group comparisons were made. In order to allow for the disproportion between the sexes a control group, matched for sex and age would be appropriate. However in respect of medical conditions other characteristics such as employment status, educational levels etc should be matched for. Matching however, precludes examinations of the variables which have been matched. A number of control groups would therefore be necessary. In a solus general practice the drawing of a matched control group within the time available for this study was not possible. The intention of this study is therefore simply to gain awareness of the characteristics of obese patients - not to compare them with the non-obese.

### **Prevalance of Obesity:**

In this study the prevalence rate of obesity was found to be 4% and 13% for males and females respectively. Prevalence studies done elsewhere show higher figures. In his study, Dawes M G <sup>6</sup>, found the prevalence rate of obesity in males to be 21% and in females, 22%. Van Itallie et al <sup>7</sup>, in a nationwide survey in the United States in 1974 found that 15% of men and 25% of women aged 20 years to 74 years were obese. In the Coris study in the Cape Province <sup>1</sup> in South Africa prevalence rates of 12% and 35% were obtained for Indian males and females respectively. There are perhaps a number of reasons why lower figures were obtained in the Phoenix study. By and large, the majority of the patients attending the general practice in Phoenix were from the 'younger' age group, who were in employment and could afford to pay for private medical services. 'Older' patients who were usually on a disability grant or pension tended to use State-run health services. Females formed the greater proportion of patients attending the general practice, probably because most were housewives. Males who were usually at work tended to consult their general practitioner only when it was extremely necessary. At the time when this study was done, an economic recession prevailed in the Country and unemployment was high. Consequently, people could not afford to see their general practitioners for their medical needs and were turning to State-run clinics and health centres. Furthermore, obesity is still not perceived as a disease, so that people only consult their family practitioner when there was an associated or unrelated medical condition.

### **Associated Medical Conditions:**

There is no doubt that obesity results in much morbidity. In the Phoenix study, mechanical problems such as dyspnoea, varicose veins and osteoarthritis occurred most frequently. In an editorial report of the Royal College of Physicians on Obesity in 1983 <sup>8</sup>, osteoarthritis and dyspnoea were described as being amongst the most frequently occurring medical conditions in obese patients. Dawes M G <sup>6</sup> in his study, also found that musculo-skeletal disorders occurred commonly in obese subjects. However, in addition, he found a high prevalence of cardiovascular disease and hypertension in his subjects. John Cohen <sup>9</sup> in his review on obesity, also described the important association of diabetes, ischaemic heart disease and hypertension with obesity. Simopoulos <sup>10</sup>, likewise emphasizes the importance of these medical conditions in obese subjects. However in the Phoenix study, diabetes mellitus and ischaemic heart disease ranked low in frequency of occurrence. Yet it is well known that diabetes mellitus and ischaemic heart disease are common 'conditions' in the Indian population. Perhaps it is due to the fact that these diseases are commonly associated with the 'older' obese patient who most likely collects a disability grant and thus seeks medical attention at State-run health clinics.



## **LIFESTYLE:**

### **Age:**

In this study the majority (65%) of subjects were in the third and fourth decades of their lives. This is not surprising when one considers that the greater proportion of patients attending the general practice were in this particular age group. Prevalence of obesity increases with advancing age, particularly between the ages 25 and 55 years and this is shown in the National Health and Nutrition Examination Surveys II (1976 - 80) in the United States <sup>11</sup>.

### **Sex:**

Obesity was commoner in the female subjects - a prevalence rate of 13% being obtained. Perhaps another reason may be that women are often bored and constantly preparing food for their families which results in nibbling between meals as well as eating at mealtimes. Unhappiness and sexual and social frustrations affect women more than men, and can result in compensatory eating <sup>12</sup>.

### **Education Level:**

Obese subjects in this study had attained a very low level of education. Eighty-one percent had either received no education at all or only a primary level education. Similar results were obtained in a 'child health screening' in Phoenix 1982 <sup>13</sup>. Many were forced to leave school at an early age and work because of poor financial circumstances. Educational institutions were few and many could not afford to pay for their

education. Many did not appreciate the value of a sound educational background through lack of proper guidance, and became dropouts at a very early age.

#### **Employment and Occupation:**

Only 30% of obese subjects were permanently employed. One could attribute this low level of employment to various factors such as poor education, the prevailing economic recession and lack of motivation. Very often there was discrimination against obese persons who were thought to make less desirable employees <sup>14</sup>. About 26% of subjects in this study held jobs where manual work was performed. The majority (46%) of subjects were housewives who had received a low-level of education. Consequently they had difficulty finding suitable jobs and became resigned to spending the rest of their lives as housewives. Perhaps, for them, the concept of 'body image' was not important then. Unlike their counterparts in the upper social class who were better-educated and active and held important jobs, some in executive positions, the concept of 'body image' became important.

#### **Marital Status and Family Size:**

The majority of subjects (88%) were married and 70% came from families of between 4 and 8 persons. The fact that obesity is more common amongst the married persons may perhaps be explained by the 'body image' concept. When one is single, one is always trying to make an impression upon the opposite sex and in this respect 'body image' is most important. Fat conjures up an image of something that is ugly, repulsive and stupid. The advent of marriage brings changes - he or she no longer is pre-occupied with 'body image' and interests now shift to other areas eg material acquisition.



### **Smoking and Alcohol Intake:**

In this study 91% of the subjects did not smoke. Of this number 88% were females. Amongst Indian women, smoking is still considered taboo. It has been reported that smoking affects obesity but this has only been evaluated for men <sup>12</sup>. Middle-aged men who smoke often weigh less than non-smokers of the same age.

Most of the subjects (95%) did not consume any alcohol. Those who did, were all males. Alcohol like smoking, is taboo to Indian women and since the majority of subjects were females this may explain the apparent low prevalence of alcohol consumption. On the other hand these figures may reflect a degree of under-reporting.

### **Exercise:**

The majority of obese subjects (84%) did not engage in any physical activities. This could be due to lack of inducement to walking, poor provision of sporting facilities in Phoenix and lack of medical encouragement for increased activity. Increase in transport facilities, labour-saving devices at work and at home all contribute to the decrease in the overall amount of exercise taken <sup>15</sup>. The introduction of television could perhaps be another factor in exacerbating sedentariness. A number of studies have shown that obese children and adults exercise less than people of normal size, even when participating in sport <sup>9</sup>.

### **Diet:**

A high proportion (70%) of obese subjects in this study consumed mainly carbohydrates, especially refined carbohydrates. Perhaps this may be due to ignorance or poor financial circumstances or the easy availability of such

foods. Another possible factor to consider is that housewives involved in food preparation, the constant access to food will make it more difficult for them to cope with the number and variety of food cues and thus housewives attempting to slim may find their role of cook making their adherence to a diet particularly difficult. So when young women start to provide food for a family, their own food habit may also change and possibly lead to an increase in energy intake. Evidence from studies on animals and humans suggest that refined carbohydrates may be a major cause of obesity <sup>12</sup>.

Thus in this Phoenix study, the overall lifestyle and characteristics of the obese subject were in close parallel with the study reported by Walker <sup>16</sup> who conducted a study on the characteristics of obese British adults and their children. They reported that mothers were more likely to be obese if (1) they came from social classes III, IV and V,;

(2) they had left school at the earliest opportunity;

(3) they had large families and

(4) they did not smoke.

### **Conclusion:**

Obesity is not a simple, single disease and further research is necessary. Much time and effort is spent in trying to treat obesity because of its risks to life and health and its damaging effect on self-esteem. However, the outcome of all this activity is not very satisfactory.

It seems quite pointless trying to treat all obese subjects. Perhaps our efforts should be directed to preventive measures and identifying and treating those subjects who have a high risk for obesity-related diseases.

### **Recommendations:**

Several possibilities exist for reducing the prevalence of obesity and obesity-related diseases.

1. Health education is important. In this regard the doctor should have a detailed knowledge of nutritional and dietetic principles first, before he is able to advise his patients. People should be taught to regard good health as a prized possession. The basis of nutrition should be taught at schools and colleges of higher education as part of an organized health education programme.
2. Exercise should be encouraged for all age groups. Increased facilities for exercise should be made available to all and paid for by taxes on refined foods, tobacco and alcohol. Employers could make sports facilities available during working hours and lifts and escalators should be reserved for the chronically sick and disabled - others should be encouraged to walk.
3. Slimming clubs and organizations. On occasion patients could be advised to join these clubs provided their programmes are supervised by a medical doctor.
4. Further research to determine the prevalence of obesity in the community, especially amongst children needs to be carried out. Once identified these obese children should be followed up for about twenty years.

5. Some form of indirect taxation could be introduced to reduce the consumption of refined and processed foods in favour of naturally - grown foods.
6. At medical schools more emphasis should be placed on nutritional education for both undergraduates and post-graduates.
7. More use should be made of nutritionists and dieticians.

A C K N O W L E D G E M E N T S

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T A B L E S

TABLE 1

Prevalence of obesity, according to sex distribution in patients aged 18 years and over, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

TYPE OF PATIENT	SEX		TOTAL
	MALE	FEMALE	
OBESE	10 ( 3,6)	80 (12,9)	90 ( 10)
NOT - OBESE	270 (96,4)	540 (87,1)	810 ( 90)
<b>TOTAL</b>	280 ( 100)	620 ( 100)	900 ( 100)

TABLE 2

Age by sex distribution of obese patients, aged 18 years and over, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

AGE IN YEARS	SEX		TOTAL
	MALE	FEMALE	
18 -	1 (10,0)	1 ( 1,3)	2 ( 2)
20 -	1 (10,0)	19 (23,8)	20 ( 22)
30 -	2 (20,0)	36 (45,0)	38 ( 43)
40 -	4 (40,0)	15 (18,8)	19 ( 21)
50 -	2 (20,0)	6 ( 7,5)	8 ( 9)
60 +	0 ( 0,0)	3 ( 3,8)	3 ( 3)
<b>TOTAL</b>	10 ( 100)	80 ( 100)	90 ( 100)

TABLE 3

Distribution of associated medical conditions, according to age, in obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

MEDICAL CONDITIONS	AGE IN YEARS						TOTAL
	18 -	20 -	30 -	40 -	50 -	60 +	
DYSPNOEA	1	17	34	17	6	2	77 ( 32)
OSTEOARTHRISIS	1	13	23	13	3	3	56 ( 23)
VARICOSE VEINS	0	4	14	4	1	1	24 ( 10)
DEPRESSION	0	9	8	6	0	0	23 ( 10)
HYPERTENSION	0	1	5	7	6	3	22 ( 9)
ANXIETY	0	6	7	2	0	0	15 ( 6)
DIABETES MELLITUS	0	0	4	3	2	0	9 ( 4)
FLAT FEET	0	2	3	1	0	0	6 ( 2)
HERNIA	0	0	3	2	0	0	5 ( 2)
ISCHAEMIC H. D.	0	0	0	2	1	1	4 ( 2)
GOUT	0	0	0	0	0	0	0 ( 0)
TOTAL	2 ( 1)	52 ( 22)	101 ( 41)	57 ( 24)	19 ( 8)	10 ( 4)	241 (100)

TABLE 4

Distribution of associated medical conditions, according to sex, in obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and prevalence percent (%).

MEDICAL CONDITIONS	SEX		TOTAL
	MALE	FEMALE	
DYSпноEA	9 (90,0)	68 (85,0)	77 (85,6)
OSTEOARTHRosis	6 (60,0)	50 (62,5)	56 (62,2)
VARICOSE VEINS	0 ( 0,0)	24 (30,0)	24 (26,7)
DEPRESSION	0 ( 0,0)	23 (28,8)	23 (25,6)
HYPERTENSION	6 (60,0)	16 (20,0)	22 (24,4)
ANXIETY	2 (20,0)	13 (16,3)	15 (16,7)
DIABETES MELLITUS	3 (30,0)	6 ( 7,5)	9 (10,0)
FLAT FEET	0 ( 0,0)	6 ( 7,5)	6 ( 6,7)
HERNIA	1 (10,0)	4 ( 5,0)	5 ( 5,6)
ISCHAEMIC H. D.	3 (30,0)	1 ( 1,3)	4 ( 4,4)
GOUT	0 ( 0,0)	0 ( 0,0)	0 ( 0,0)
<b>N = 90</b>	10 ( 11)	80 ( 89)	90 ( 100)

TABLE 5

Education levels, according to age, of obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

EDUCATION LEVEL	AGE IN YEARS						TOTAL
	18 -	20 -	30 -	40 -	50 -	60 +	
NIL	0	1	8	4	3	3	19 ( 21)
CLASS 1 - STD VI	1	11	25	12	5	0	54 ( 60)
STD VII - MATRIC	1	7	5	3	0	0	16 ( 18)
POST-MATRIC	0	1	0	0	0	0	1 ( 1)
TOTAL	2 ( 2)	20 ( 22)	38 ( 43)	19 ( 21)	8 ( 9)	3 ( 3)	90 (100)

TABLE 6

Education levels, according to sex, of obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

EDUCATION LEVEL	SEX		TOTAL
	MALE	FEMALE	
NIL	0 ( 0)	19 (23,8)	19 ( 21)
CLASS 1 - STD VI	5 (50,0)	49 (61,3)	54 ( 60)
STD VII - MATRIC	5 (50,0)	11 ( 3,8)	16 ( 88)
POST-MATRIC	0 ( 0)	1 ( 1,3)	1 ( 1)
<b>TOTAL</b>	10 ( 100)	80 ( 100)	90 ( 100)

TABLE 7

Employment status of obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

EMPLOYMENT STATUS	NO.
UNEMPLOYED	16 ( 18)
HOUSEWIFE	41 ( 46)
PENSIONER	1 ( 1)
STUDENT	1 ( 1)
PERMANENTLY EMPLOYED	27 ( 30)
CASUALLY EMPLOYED	4 ( 4)
<b>TOTAL</b>	90 (100)



TABLE 8

Type of employment held by obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

TYPE OF EMPLOYMENT	NO.
NOT APPLICABLE	58 ( 64)
NON-MANUAL - PROFESSIONAL	3 ( 3)
NON-MANUAL - NON-PROFESSIONAL	6 ( 7)
MANUAL - SKILLED	17 ( 19)
MANUAL - UNSKILLED	6 ( 7)
<b>TOTAL</b>	90 (100)

TABLE 9

Marital status of obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

MARITAL STATUS	NO.
MARRIED	79 ( 88)
UNMARRIED	5 ( 6)
DIVORCED	3 ( 3)
WIDOW	3 ( 3)
<b>TOTAL</b>	90 (100)

TABLE 10

Family size of obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

FAMILY SIZE - NUMBER OF PERSONS	NO.
< 4	13 ( 14)
4 -	63 ( 70)
8 -	14 ( 16)
12 +	0 ( 0)
TOTAL	90 (100)

TABLE 11

Duration of physical activities performed according to sex of obese patients attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

SEX	DURATION OF PHYSICAL ACTIVITIES HOURS PER WEEK					TOTAL
	NIL	1 HOUR	1 -	3 -	7 +	
MALE	9 (90,0)	0 ( 0,0)	1 (10,0)	0 ( 0,0)	0 ( 0,0)	10 ( 11)
FEMALE	66 (82,5)	4 ( 5,0)	6 ( 7,5)	3 ( 3,8)	1 ( 1,3)	80 ( 89)
TOTAL	75 ( 84)	4 ( 4)	7 ( 8)	3 ( 3)	1 ( 1)	90 ( 100)

TABLE 12

Main dietary habits, of obese patients attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

DIETARY CHARACTERISTICS	NUMBER	(%)
CARBOHYDRATE EXCESS	63	( 70)
PROTEIN EXCESS	1	( 1)
FAT EXCESS	0	( 0)
BALANCED	26	( 29)
TOTAL	90	(100)

TABLE 13

Main dietary habits, according to sex, of obese patients attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

DIETARY HABITS	S E X	
	MALE	FEMALE
CARBOHYDRATE EXCESS	5 ( 50%)	58 (72,5%)
PROTEIN EXCESS	1 ( 10%)	0 ( 0,0%)
FAT EXCESS	0 ( 0,0%)	0 ( 0,0%)
BALANCED	4 ( 40%)	22 (29,0%)
TOTAL	10 ( 100%)	80 ( 100%)

TABLE 14

Main dietary habits, according to education levels, of obese patients attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

TYPE OF DIET	EDUCATION LEVEL				TOTAL
	NIL	CLASS i - STD. VI	STD VII - MATRIC	POST-MATRIC	
CARBOHYDRATE	13 (68,4)	39 (72,2)	10 (62,5)	1 (10,0)	63 ( 70)
PROTEIN	0 ( 0,0)	0 ( 0,0)	1 ( 6,3)	0 ( 0,0)	1 ( 1)
FAT	0 ( 0,0)	0 ( 0,0)	0 ( 0,0)	0 ( 0,0)	0 ( 0)
BALANCED	6 (31,6)	15 (27,8)	5 (31,2)	0 ( 0,0)	26 ( 29)
<b>TOTAL</b>	19 ( 100)	54 ( 100)	16 ( 100)	1 ( 100)	90 ( 100)



TABLE 15

Smoking habits, according to employment status, of obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

SMOKING HABITS	EMPLOYMENT						TOTAL
	NIL	HOUSEWIFE	PENSIONER	STUDENT	EMPLOYMENT PERMANENT	EMPLOYMENT CASUAL	
SMOKERS	0 ( 0,0)	0 ( 0,0)	1 ( 100)	0 ( 0,0)	6 (22,2)	1 (25,0)	8 ( 9)
NON-SMOKERS	16 ( 100)	41 ( 100)	0 ( 0,0)	1 ( 100)	21 (77,8)	3 (75,0)	82 ( 91)
TOTAL	16 ( 100)	41 ( 100)	1 ( 100)	1 ( 100)	27 ( 100)	4 ( 100)	90 ( 100)

TABLE 16

Smoking habits, according to sex, of obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

SMOKING HABIT	SEX		TOTAL
	MALE	FEMALE	
SMOKERS	7 (70,0)	1 ( 1,3)	8 ( 9)
NON-SMOKERS	3 (30,0)	79 (98,7)	82 ( 91)
<b>TOTAL</b>	10 ( 100)	80 ( 100)	90 ( 100)

TABLE 17

Alcohol consumption according to sex of obese patients, attending the Researcher's general practice during the period 1 August 1985 - 31 October 1985: Number and percent (%).

TYPE OF ALCOHOL	AMOUNT CONSUMED WEEKLY	SEX		TOTAL
		MALE	FEMALE	
-	NIL	5 (50,0)	80 ( 100)	85 ( 95)
WINE	< 1 BOTTLE	0 ( 0,0)	0 ( 0,0)	0 ( 0)
WINE	1+ BOTTLE	0 ( 0,0)	0 ( 0,0)	0 ( 0)
SPIRITS	< 1 BOTTLE	3 (30,0)	0 ( 0,0)	3 ( 3)
SPIRITS	1+ BOTTLE	0 ( 0,0)	0 ( 0,0)	0 ( 0)
BEER	< 1 BOTTLE	0 ( 0,0)	0 ( 0,0)	0 ( 0)
BEER	1+ BOTTLE	2 (20,0)	0 ( 0,0)	2 ( 2)
TRAD. DRINK	< 1 BOTTLE	0 ( 0,0)	0 ( 0,0)	0 ( 0)
TRAD. DRINK	1+ BOTTLE	0 ( 0,0)	0 ( 0,0)	0 ( 0)
<b>TOTAL</b>	-	10 ( 100)	80 ( 100)	90 ( 100)

## P R O T O C O L

### THE PREVALENCE OF OBESITY AND ASSOCIATED MEDICAL CONDITIONS IN AN URBAN INDIAN GENERAL PRACTICE

#### **Problem:**

The prevalence of obesity and associated medical conditions amongst Indian patients attending an urban general practice in Phoenix is not known.

#### **Objectives:**

- (1) To determine the prevalence of obesity in the author's general practice.
- (2) To identify medical conditions associated with obesity.
- (3) To determine the personal characteristics of the obese patient.
- (4) To make recommendations in respect of reducing the prevalence of obesity and associated medical conditions.

#### **Collection of Data:**

##### **(1) Criteria**

###### **(a) Obesity:**

Any person whose weight is in excess of the range in the height/weight normogram is defined as obese (ANNEXURE "C").

###### **(b) General Practice:**

Comprehensive practice of general medicine at preventive, promotive, diagnostic, therapeutic and rehabilitative levels and directed to individual patients and their families in terms of the needs of the particular service in which the practitioner operates and the communities he serves.

###### **(c) Phoenix:**

An Indian township situated approximately 20 kilometres North of central Durban. It provides housing for Indians in the economic and sub-economic groups.

(d) **Urban:**

Pertaining to, characteristic of, including or constituting a city.

(e) **Patient:**

All patients 18 years of age and older and who attend the Researcher's practice for the first time during the study period.

(f) **Lifestyle:**

Personal characteristics of the patient ie. age, sex, education, employment, occupation, marital status, family size, habits relating to alcohol and smoking.

(g) **Eating Habits:**

Recall of the patients' diet the day prior to attending the Researcher's practice for health care.

(h) **Physical Activities:**

Sports (soccer, cricket, tennis, squash, swimming, karate, judo, athletics), gardening, jogging, walking.

(i) **Family Size:**

All members living under the same roof and who are interdependent financially and socially.

(j) **Associated Medical Conditions:**

- ( i) PSYCHOLOGICAL : Depression, anxiety.
- ( ii) MECHANICAL DISABILITIES : Flat feet; osteoarthritis of knees, hips and lumbar spine; hernias; varicose veins; exertional dyspnoea.
- (iii) METABOLIC : Gout, diabetes mellitus.
- ( iv) CARDIOVASCULAR : Hypertension, ischaemic heart disease.



(2) **Reduction of Bias**

(a) **Sample:**

All Indian patients 18 years of age and older attending the Researcher's general practice during the study period and who are obese as defined in the criteria will be included in the sample.

**Control:**

No control group will be drawn for the purpose of this study.

(b) Standard questionnaires and check lists for data collection will be used.

(c) The entire study will be conducted by the Researcher in his general practice.

(d) Adhering to the protocol.

(3) **Methods of Data Collection**

All patients selected for inclusion in the study will be informed of the confidentiality of data collected. Data will be collected using standardized questionnaire and checklists (ANNEXURE "E").

The patients will be interviewed personally by the Author. The study will be conducted from 1 August 1985 to 31 October 1985.

In respect of identifying medical conditions associated with obesity information from the patients' records in the Researcher's general practice will be utilized and where this is not available a questionnaire to identify the above conditions will be administered to the patient.



**(4) Time Barriers**

( i) Submission of protocol - 26 July 1985.

( ii) Collection of data.

Study period : 1 August 1985                      31 October 1985.

(iii) Collation and analysis of data - 31 December 1985

( iv) Submission of summary tables - 31 January 1986

( v) Submission of report - 30 June 1986

**(5) Appraisal of Literature**

This will be ongoing throughout the study.

**(6) Collation and Analysis of Data**

Data will be collected and analysed manually.

**(7) Evaluation of the Interrelationships of the Data**

Interrelationships will be evaluated and their presence or absence will be recorded.

**(8) Advancement of Hypothesis of the Multiple Factors of Causation and Methods of Interception**

Hypothesis based upon the findings of this study will be advanced and included in the published findings.

**(9) Field Trials of Hypothesis**

Field trials of the hypothesis advanced will not be carried out owing to time and other constraints.

(10) **Final Definition of Causative Factors Determined and Recommendations made of Methods of Interception to Control the Problem**

As no field trials will be undertaken in respect of the advanced hypothesis, causative factors cannot be finally defined.

(11) **Publication**

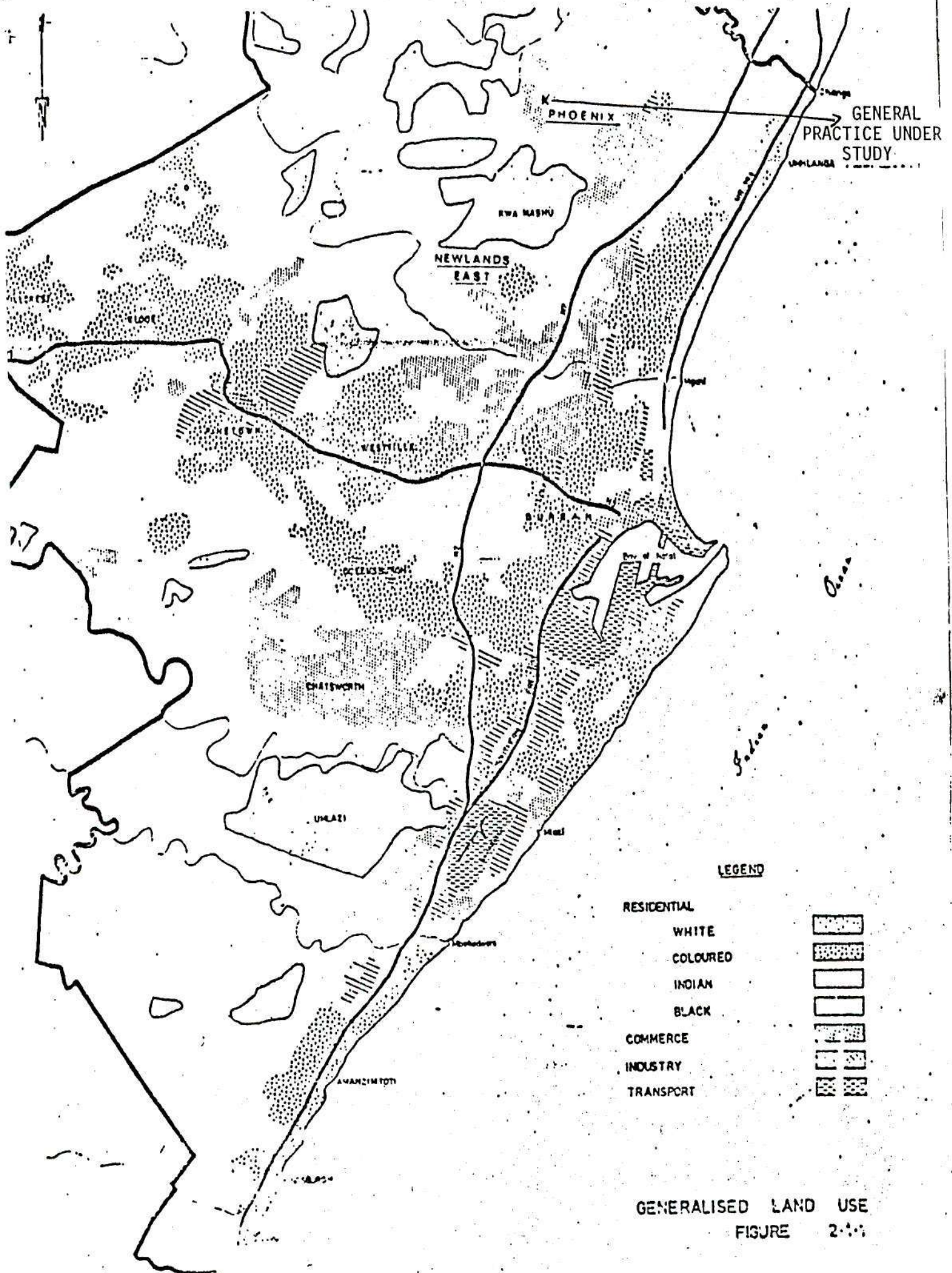
A report of the study undertaken will be submitted to the Department of Community Health. This report will take the form of a thesis.

GUIDELINES FOR BODY WEIGHT

Height (m)	MEN (KG)			WOMEN (KG)		
	Acceptable Average	Acceptable Weight Range	Obese	Acceptable Average	Acceptable Weight Range	Obese
1.45				46.0	42 - 53	64
1.48				46.5	42 - 54	65
1.50				47.0	43 - 55	66
1.52				48.5	44 - 57	68
1.54				49.5	44 - 58	70
1.56				50.4	45 - 58	70
1.58	55.8	51 - 64	77	51.3	46 - 59	71
1.60	57.6	52 - 65	78	52.6	48 - 61	73
1.62	58.6	53 - 66	79	54.0	49 - 62	74
1.64	59.6	54 - 67	80	55.4	50 - 64	77
1.66	60.6	55 - 69	83	56.8	51 - 65	78
1.68	61.7	56 - 71	85	58.1	52 - 66	79
1.70	63.5	58 - 73	88	60.0	53 - 67	80
1.72	65.0	59 - 74	89	61.3	55 - 69	83
1.74	66.5	60 - 75	90	62.6	56 - 70	84
1.76	68.0	62 - 77	92	64.0	58 - 72	86
1.78	69.4	64 - 79	95	65.3	59 - 74	89
1.80	71.0	65 - 80	96			
1.82	72.6	66 - 82	98			
1.84	74.2	67 - 84	101			
1.86	75.8	69 - 86	103			
1.88	77.6	71 - 88	106			
1.90	79.3	73 - 90	108			
1.92	81.0	75 - 93	112			



MAP OF : PHOENIX - SITUATED IN THE METROPOLITAN AREA OF DURBAN



GENERALISED LAND USE  
FIGURE 2.4.1

## QUESTIONNAIRE

1. Name :

2. Number

3. Address:

4. Age In Years:

5. Sex

6. Height In Metres

7. Weight in Kg.

8. Education Level Completed

Nil ☐

Class i - Std. VI

☐

Std.VII - Matric

☐

Post Matric

☐

9. Employment:

Unemployed

☐

Housewife

☐

Pensioner

☐

Student

☐

Employed - permanent

☐

Employed - casual

☐

10. Type Of Employment:

Non-manual

Professional

☐

Manual - Skilled

☐

Non-Professional

☐

Manual - Unskilled

☐

11. Marital Status:

Married

☐

Unmarried

☐

Divorced

☐

Widow

☐

12. Family Size:

3 Persons

☐

4 - 7 Persons

☐

8 - 12 Persons

☐

12 Persons

☐

13. Physical Activities:

Soccer

☐

Tennis

☐

Swimming

☐

Judo

☐

Cricket

☐

Squash

☐

Karate

☐

Athletics

☐

Gardening

☐

Jogging

☐

Walking

☐

Other

☐

Nil

☐

14. Eating Habits:

24 Hour Recall of Previous Day.

Breakfast

Lunch

Dinner

15. **Alcohol Consumption:**

No. of mls./week

Wine ☐

Spirits ☐

Beer ☐

Traditional Drinks ☐

Nil ☐

16. **Cigarette Smoking:**

Yes ☐

No ☐

17. **Associated Medical Conditions:** (To be obtained either from the patients personal records or from direct questioning of patients)

(a) **Psychological:**

Depression ☐

Anxiety ☐

(b) **Mechanical Disabilities:**

Flat Feet ☐

Osteoarthritis of knee, hips, lumbar spine ☐

Hernias ☐

Varicose Veins ☐

Exertional Dyspnoea ☐

(c) **Metabolic:**

Gout ☐

Diabetes Mellitus ☐

(d) **Cardiovascular:**

Hypertension ☐

Ishaemic Heart Disease ☐